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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CATHERINE MARY DOLBEAR and
PAOLA MARCELLA HOBSON

Appeal 2009-006330
Application 10/070,069[1]
Technology Center 2600

Decided: March 5, 2010

Before JOHN C. MARTIN, MARC S. HOFF,
and THOMAS S. HAHN, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] The real party in interest is Motorola Inc.

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 (a) from a Final Rejection of claims 1-3 and 5-11. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

Appellants' invention concerns a method of enhancing a video bit stream using temporal scalability, wherein the number of bits or a temporal position of a bidirectionally predicted picture (B) in an enhancement layer is determined with reference to a corresponding characteristic of pictures in another layer or layers, such as a base layer, of the video bit stream. Furthermore, the peak signal to noise ratio (PSNR) of the B picture may be matched to that of the pictures in the layer below. (Abstract).

Claim 1 is exemplary:

1. A method of enhancing a video bit stream using temporal scalability, wherein peak signal-to-noise ratios of bidirectionally predicted pictures in an enhancement layer are determined with reference to the peak signal-to-noise ratios of pictures in another layer.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Wan	US 6,580,754 B1	Jun. 17, 2003

Claims 1-3 and 5-11 stand rejected under 35 U.S.C. 102(e) as being anticipated by Wan.

Rather than repeat the arguments of Appellants or the Examiner, we make reference to the Appeal Brief (filed June 30, 2007) and the Supplemental Examiner's Answer (mailed November 6, 2007) for their respective details.

ISSUES

The Examiner acknowledges that although Wan only uses the PSNR measurement as an operative metric throughout the reference in conjunction with simulcast coding, the PSNR measurement is used pervasively with reference to spatial scalability and, thus, would inherently be used in the implementation of temporal scalability coding (Ans. 8). The Examiner finds further that Wan discloses bit allocation of B-pictures within the enhancement layer relative to the base layer (Ans. 9). The Examiner also finds that Wan discloses that the position and placement of the enhancement layer B frames are spaced at fixed intervals with regards to frames in the base layer (Ans. 9). The Examiner concludes that claim recited terms, such as "determined with reference to," "determined to be spaced evenly," "made similar," and "are considered," define the most tenuous of interrelationships which may be met from simple deconstruction of Wan (Ans. 10).

Appellants contend "a method of enhancing a video bit stream using temporal scalability" is not expressly or inherently disclosed in Wan (App. Br. 10). Specifically, Appellants contend that Wan does not disclose determining the PSNR of the B-pictures in the enhancement layer with reference to temporal scalability (App. Br. 12). Appellants also contend that Wan discloses bit allocation for encoding pictures of an enhancement layer with respect to simulcast coding and not temporal scalability (App. Br. 13). Appellants further contend that Wan does not disclose that the temporal positions of the B-pictures in the enhancement layer are determined to be spaced evenly with reference to temporal positions of pictures in other layers (App. Br. 14).

Appellants' contentions present us with the following three issues:

1. Does Wan disclose "[a] method of enhancing a video bit stream using temporal scalability, wherein peak signal-to-noise ratios of bi-directionally predicted pictures in an enhancement layer are determined with reference to the peak signal-to-noise ratios of pictures in another layer?" (Claim 1.)

2. Does Wan disclose "[a] method of enhancing a video bit stream using temporal scalability, wherein the number of bits allocated to encode a bidirectionally predicted picture of an enhancement layer is determined with reference to the number of bits used to encode a picture of another layer?" (Claim 2.)

3. Does Wan disclose "[a] method of enhancing a video bit stream using temporal scalability, wherein temporal positions of bidirectionally predicted pictures in an enhancement layer are determined to be spaced evenly with reference to temporal positions of pictures in other layers?" (Claim 3.)

FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

The Invention

1. According to Appellants, the invention concerns a method of enhancing a video bit stream using temporal scalability, wherein the number of bits or a temporal position of a bidirectionally predicted picture in an enhancement layer is determined with reference to a corresponding characteristic of pictures in another layer, such as a base layer, of the video

bit stream. Further, the peak signal to noise ratio (PSNR) of the B picture may be matched to that of the pictures in the layer below (Abstract).

2. Prior art video transmission arrangements use separate rate control algorithms for the base layer and the enhancement layers to determine quantization parameters (and hence the PSNR quality of the P and B pictures differ) (Spec. 4:7-32).

3. Prior art video transmission arrangements do not have equivalent bit rates for the pictures of the base layer and the enhancement layer (Spec. 5:1-7).

4. Prior art video transmission arrangements do not evenly distribute in time the pictures of the base layer and the enhancement layer (Spec. 5:10-14).

Wan

5. Wan discloses techniques for selecting between simulcast coding and spatial scalability for multicast services, such as multicast video (col. 4, ll. 4-6).

6. Wan discloses that the general concept of scalability with reference to temporal and spatial scalability includes encoding video into an independent base layer and one or more dependent enhancement layers. Specifically, a scalable encoder 100 takes an input base video layer which is up-sampled at a midprocessor 120 to provide a reference image for predictive coding of the input enhanced video layer at an enhancement layer encoder 130. As such, the enhancement layer encoder uses information about the base layer provided by the midprocessor to efficiently code the enhancement layer (Fig. 1, col. 4, ll. 35-60).

7. Wan discloses that temporal scalability permits an increase in the temporal resolution by using one or more enhancement layers in addition to the base layer. Wan discloses an example of temporal scalable coding having two layers, wherein basic video is obtained by decoding only the independent base layer 200. Use of the dependent enhancement layer 250 provides video with, e.g., seven times the temporal resolution of the basic video (Fig. 2, col. 5, ll. 25-35).

8. Wan discloses determining the quantization step size Q_B used for bit allocation in the enhancement layer as a function of the quantization step size Q_I used for bit allocation in the base layer with respect simulcast coding (Table 1, col. 6, ll. 50-55).

9. Wan discloses determining the PSNR of the lower resolution layer or quarter common intermediate format (QCIF) stream as a function of the higher-resolution or common intermediate (CIF) stream for simulcast coding (col. 8, l. 46-col.9, l. 17).

PRINCIPLES OF LAW

Anticipation pursuant to 35 U.S.C § 102 is established when a single prior art reference discloses expressly or under the principles of inherency each and every limitation of the claimed invention. *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999); *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994).

Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable

construction in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). The properly interpreted claim must then be compared with the prior art.

In an appeal from a rejection for anticipation, Appellants must explain which limitations are not found in the reference. *See Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997) ("[W]e expect that the Board's anticipation analysis be conducted on a limitation by limitation basis, with specific fact findings for each *contested* limitation and satisfactory explanations for such findings.")(emphasis added). *See also In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006)

ANALYSIS

Claims 1-3 and 5-11

Independent claim 1 recites "[a] method of enhancing a video bit stream using temporal scalability, wherein peak signal-to-noise ratios of bi-directionally predicted pictures in an enhancement layer are determined with reference to the peak signal-to-noise ratios of pictures in another layer."

Independent claim 2 recites "[a] method of enhancing a video bit stream using temporal scalability, wherein the number of bits allocated to encode a bidirectionally predicted picture of an enhancement layer is determined with reference to the number of bits used to encode a picture of another layer."

Independent claim 3 recites "[a] method of enhancing a video bit stream using temporal scalability, wherein temporal positions of bi-directionally predicted pictures in an enhancement layer are determined to

be spaced evenly with reference to temporal positions of pictures in other layers."

The Examiner finds that Wan discloses each element of the claims rejected (Ans. 4-5 and 7). The Examiner acknowledges that although Wan only uses the PSNR measurement as an operative metric throughout the reference in conjunction with simulcast coding, the PSNR measurement is used pervasively with reference to spatial scalability and, thus, would inherently be used in the implementation of temporal scalability coding (Ans. 8). The Examiner finds that Wan clearly discloses that the dependent enhancement layer frames are constructed using information from the independent base layer which may include the use of the factors as broadly recited in the claims (Ans. 8). The Examiner finds further that Wan discloses bit allocation for the enhancement layer relative to the base layer (Ans. 9). The Examiner finds that Wan discloses that the position and placement of the enhancement layer B frames are spaced at fixed intervals with regards to frames in the base layer (Ans. 9).

The Examiner concludes that claim recited terms such as "determined with reference to," "determined to be spaced evenly," "made similar," and "are considered," define the most tenuous of interrelationships which may be met from simple deconstruction of Wan (Ans. 10).

Appellants contend only a "brief review" of temporal scalability is disclosed in Wan and that "a method of enhancing a video bit stream using temporal scalability" is not expressly or inherently disclosed in Wan (App. Br. 10). Specifically, Appellants contend that Wan does not disclose determining the PSNR of the B-pictures in the enhancement layer for temporal scalability; rather Wan discloses determining the PSNR between

layers for simulcast coding (App. Br. 12, FF 9). Appellants also contend further that Wan discloses bit allocation for encoding pictures of an enhancement layer with respect to simulcast coding and not temporal scalability (App. Br. 13, FF 8). Appellants further contend that Wan does not disclose that the temporal positions of the B-pictures in the enhancement layer are determined to be spaced evenly with reference to temporal positions of pictures in other layers (App. Br. 14).

Although Wan discloses temporal scalability encoding wherein the enhancement layer encoder uses information about the base layer provided by the midprocessor to efficiently code the enhancement layer, Wan is silent as to the treatment of the PSNR, bit allocation, and temporal positions of B-pictures as a function of these same variables of the pictures in another layer (FF 5-7). We agree with Appellants that Wan does not disclose determining the PSNR or bit allocation of the B-pictures in the enhancement layer temporal scalability as required by respective independent claims 1 and 2. In particular, Wan discloses determining the PSNR of the lower resolution layer or quarter common intermediate format (QCIF) stream as a function of the higher-resolution or common intermediate (CIF) stream for *simulcast coding* and *not* temporal scalability (FF 9). In addition, Wan discloses determining the quantization step size Q_B used for bit allocation in the enhancement layer as a function of the quantization step size Q_I used for bit allocation in the base layer with respect *simulcast coding* and *not* temporal scalability (FF 8).

Furthermore, we agree with Appellants that Wan does not disclose that the temporal positions of pictures in the enhancement layer are

determined to be spaced evenly with reference to temporal positions of pictures in other layers, as required by independent claim 3.

Specifically, Appellants acknowledge that prior art video transmission arrangements use separate rate control algorithms for the base layer and the enhancement layers to determine quantization parameters (FF 2). Furthermore, Appellants acknowledge that prior art video transmission arrangements do not have equivalent bit rates for the pictures of the base layer and the enhancement layer (FF 3) nor do they evenly distribute in time the pictures of the base layer and the enhancement layer (FF 4). Since Wan is silent as to the treatment of the PSNR, bit allocation, and temporal positions of B-pictures as a function of these same variables of the pictures in another layer, we find that Wan merely discloses that which is included in prior art video transmission arrangements as disclosed in Appellants' Specification.

We find that the Examiner erred in finding that Wan discloses all the limitations of independent claims 1-3. Thus, we will not sustain the Examiner's rejection of independent claims 1-3 and dependent claims 5-11 under 35 U.S.C. § 102(e) as anticipated by Wan.

CONCLUSIONS

Wan does not disclose "[a] method of enhancing a video bit stream using temporal scalability, wherein peak signal-to-noise ratios of bi-directionally predicted pictures in an enhancement layer are determined with reference to the peak signal-to-noise ratios of pictures in another layer." (Claim 1.)

Wan does not disclose "[a] method of enhancing a video bit stream using temporal scalability, wherein the number of bits allocated to encode a bidirectionally predicted picture of an enhancement layer is determined with reference to the number of bits used to encode a picture of another layer." (Claim 2.)

Wan does not disclose "[a] method of enhancing a video bit stream using temporal scalability, wherein temporal positions of bidirectionally predicted pictures in an enhancement layer are determined to be spaced evenly with reference to temporal positions of pictures in other layers." (Claim 3.)

ORDER

The Examiner's rejection of claims 1-3 and 5-11 reversed.

REVERSED

ELD

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